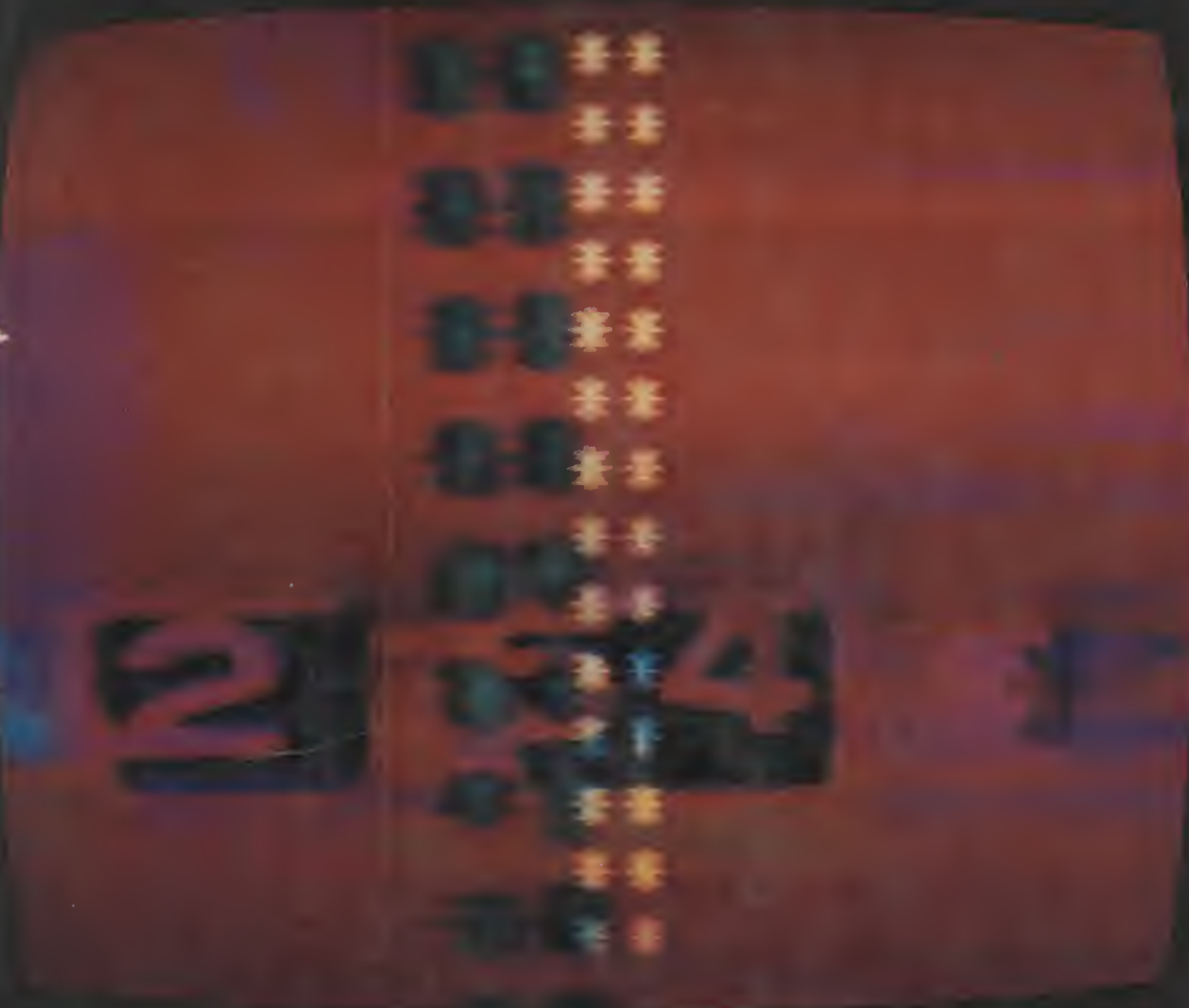


ART AND THE FUTURE



A HISTORY/PROPHECY
OF THE COLLABORATION BETWEEN SCIENCE, TECHNOLOGY AND ART
BY DOUGLAS DAVIS

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JUST US



The Radical Shift: Technology as Creative Force

The Late 1960's in the United States: The Movement Becomes Explicit

Just as there is no precise parallel in the American experience for the flood of manifestos and declarations that launched technological art in Europe early in this century, there is really no "group" phenomenon either. During the late 1960's, American art devoted itself to technology far more explicitly and self-consciously than before, but the causative agents were individual breakthroughs made by "artists" in the traditional sense.

Among the early exceptions were the Anonima Group, which confined itself largely to the production of paintings and drawings with strong retinal impact, and USCO, which pushed further in the direction of anonymity than any other American group. The "Us Company," formed in 1962, set up shop—plus a permanent environmental light display—in an abandoned Garnersville, New York, church. Including artists, engineers, poets, and filmmakers, USCO mixed film, tapes, slides, and light in its audiovisual performances, each in strong, unmodulated quantities. They gladly exchanged finesse for quantitative impact, the very "overkill" that the Korean artist Nam June Paik later associated with indigenous American art. USCO's leaders were strongly influenced by McLuhan's ideas as expressed in his book *Understanding Media*. Their environments—performed in galleries, churches, schools, and museums across the United States—increased in complexity with time, culminating in multiscreen audiovisual "worlds" and strobe environments. They saw technology as a means of bringing people together in a new and sophisticated tribalism. In pursuit of that ideal, they lived, worked, and created together in virtual anonymity. "We are all one," the group declared in a statement in the *Kunst Licht Kunst* catalogue, "beating the tribal drum of our new electronic environment."

USCO's open dedication to the use of technology in art is one of the earliest indications that American innocence in this regard, whether intentional or not, was at an end. By the late 1960's, the work that had been done in Europe was well known in the United

States, much of it through the Howard Wise Gallery in New York, which helped to fill the vacuum left by American museums; the theories of both McLuhan and architect-designer-engineer-visionary R. Buckminster Fuller were by then common parlance. McLuhan had maintained in *Understanding Media* (1964) that the new communication media girdled the globe like nature itself, steadily altering both our sensibilities and our means of perception. The new man, he predicted, would be oriented by television toward his senses rather than his mind, toward broad tribal rather than nationalistic patterns of behavior. McLuhan linked specialization and fragmentation with the beginnings of man's dependence on print as information, in the Renaissance. Fuller had insisted from the beginning of his career in the late 1920's—from the days when he designed totally prefabricated and transportable "Dymaxion" homes, cars, and bathrooms—that the new technology would radically alter the entire globe. Between 1955 and 1965, however, when his spherical geodesic dome structures spanning wide spaces at low cost gained widespread acceptance, particularly from industry, Fuller's theories won new respect. His book *Nine Chains to the Moon*, first published in 1938, was opened and read again; there Fuller argued—like McLuhan—that technological change carried with it radical social and economic implications. If we properly organize and direct our new resources, Fuller claimed, we can rid the globe of physical and spiritual poverty. Like Banham's later writings in England, Fuller's stimulated a new generation of architects devoted to disposable and removable structures, designed for a kinetic society.

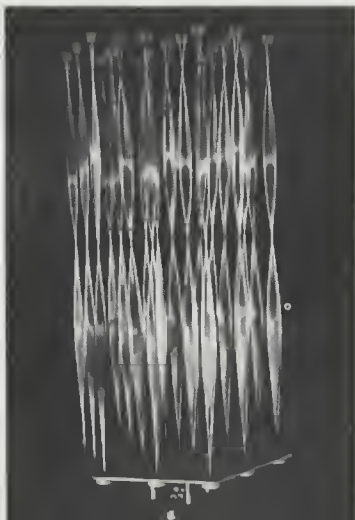
By 1966, a pivotal year in American art in any case, the idea that technology represented an alien, anti-human, anti-art force had been cast in doubt. In retrospect, the time appears to have been ripe for the project, launched by Robert Rauschenberg and Swedish engineer Billy Klüver, that culminated in the founding of Experiments in Art and Technology, Inc. (EAT). Klüver had appeared on the New York scene as technical assistant for Jean Tinguely in the creation of



Pulsa group. *Boston Public Gardens Demonstration*, 1968. Fifty-five xenon strobe lights were placed underwater in the garden's four-acre pond, together with 52 polyplanar speakers above water. Both were programmed by computer and magnetic tape to emit cyclical light and sound flashes throughout the park.



Wen-Yeng Tsai. *Cybernetic Sculpture*, 1969. Stainless steel rods and base, motorized, with stroboscopic light. 72" h. The rods vibrate in response to the strobe patterns and to the sounds made by the viewers. Courtesy Howard Wise Gallery, New York. Photo by Philippe Halsmann.



Environmental Space and Time: The "Living" Work of Art

The evidence of similar extensions abounded as the 1960's came to a close. There was widespread involvement in what is best called "environmental" forms—works of art that fill, activate, or respond to the surrounding environment, frequently including the viewer himself. Les Levine created *Slip-cover* at the Architectural League, filling three rooms with giant mylar bags that expanded and contracted, sometimes pressing spectators against the wall. The Intersystems group put together several technically sophisticated environments in Toronto, Canada, collectively entitled *The Mind Excursion Center*, where in addition to the usual barrage of light and sound there were changing shapes, smells and colors to experience. The Pulsa group, organized by seven artists and archi-

tects teaching at Yale,⁵¹ performed an "all-weather" event in the Boston Public Garden, surrounding the audience with fifty-five underwater strobe lights and fifty-five amplifiers, which were programmed by computer to project streams of light and sound through the park at high speeds. The event, declared Pulsa, was "the first work which was conceived on a scale and system comparable to the scale and system of today." One year later, the group created another outdoor environment in the garden of the Museum of Modern Art for its *Spaces* exhibition, employing computer-programmed electronic devices that responded to heat, sound, light, and movement with heat, sound, light, and movement of their own.

Robert Whitman's *Pond*, installed at the Jewish Museum with the help of engineer Eric Rawson, enclosed the audience within a circle

of vibrating mirrors that altered sensory perception minute by minute. With a team of engineers, Robert Rauschenberg built *Soundings*, a plexiglass wall covered with silk-screened images that lit up in response to the voices of nearby observers. The slender, stainless-steel "cybernetic" rods of Wen-Ying Tsai vibrated in response to the clapping of hands, as well as to the flashes of a strobe light, simulating, as Tsai said, "the intensity of a living creature." Boyd Mefferd used the strobe more aggressively than anyone, surrounding his audience at the Los Angeles *Art and Technology* exhibition with 500 Universal television flash tubes. Their impact created "head art"—images that danced inside the viewer's mind when he closed his eyes, often in self-defense.

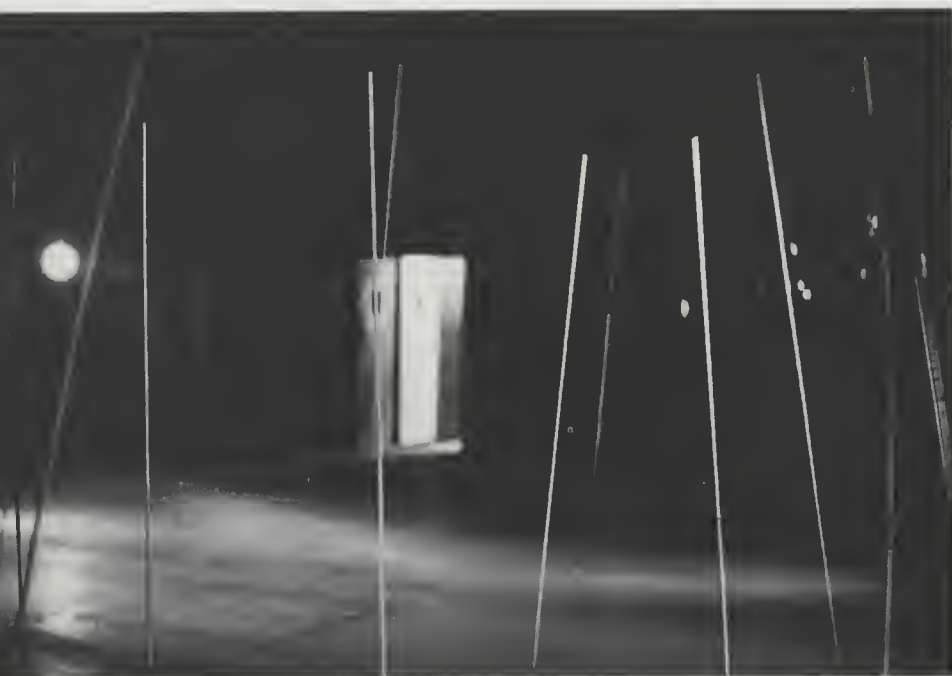
The sound-light environments of Keith Sonnier, which followed most of these works in time, advanced the responsive art considerably, in terms of esthetic control. Sonnier blended the spectator almost imperceptibly into the total work; in one such piece, typical of many others, the viewer entered a small room bathed in soft red light and filled



Robert Whitman. *Pond*, 1969. Installed at the Jewish Museum in New York, this electronic environment incorporated 8 vibrating concave mylar mirrors, 4½' in diam., strobe lights, slide projectors, and a continuous tape-loop sound system repeating a sequence of single words and phrases, with long pauses in between. The room was dark. The viewer could see himself in the large mirrors but the oscillation of surface, sound, and light continually and subtly changed what he saw. Engineer: Eric Rawson. Courtesy The Jewish Museum, New York.

Robert Rauschenberg. *Soundings*, 1968. Silkscreened ink on plexiglass with electronic equipment. Construction 36' l., made of 27 panels 8' h., arranged in rows of three each. As spectators clap or call out, various parts of the work light up, revealing the images silkscreened upon its face. The Ludwig Collection, Wallraf-Richartz Museum, Cologne, Germany. Courtesy Dr. Peter Ludwig.





Les Levine. *Photon: Strangeness 4*, 1967. Performed in a room 100' x 50', filled with vibrating wires, moving fish-eye mirrors, electromechanically operated TV cameras, and monitors. The viewer sees himself in a variety of images and sizes as he moves through the room. He also feels as if the space is moving in all directions at once. Levine was assisted in planning the room by George Fan, an IBM research physicist.

Ted Kraynik. *Synergic Light Buoys*, plan, 1968. Floating in a city harbor, these buoys would respond to the city as an organic entity, their lights rising and falling in response to urban activity patterns—to the number of telephone calls, to traffic patterns on the streets and subways, to gas and electricity consumption.



with video cameras. The images were transmitted into a second gallery activated by amplifiers and loudspeakers, thus linking man, image, and sound in a subtle unity. In the case of both Sonnier and his predecessors, the work defined itself by an active relationship between the materials employed and their surroundings. Participation was easily the dominant theme in the environmental art of the late 1960's.

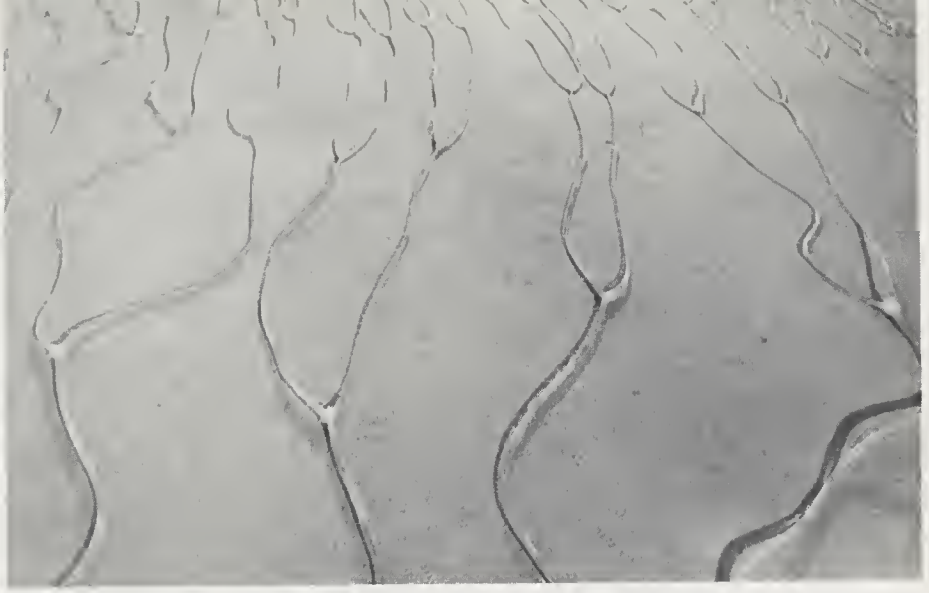
The environmental movement concerned much more than response, however. There was concern for the "life" of the work of art, not only its form. This is a difficult concept to define. In his book, *Beyond Sculpture*, Jack Burnham equates it with "systems" thinking. Its major esthetic significance, however, is this: we equate art now as much with activity as with object. We expect art to do much more than stand before us. We want it to engage in a dialogue with the environmental life process.

The crudest signs of this can be seen in Fletcher Benton's concern for the "life" in his kinetic machines, as evidenced in the instructions he sends along with them, plus his stated willingness to repair them if necessary; in exhibitions like *NUL*, at the Stedelijk in Amsterdam in 1962, when the museum commissioned ZERO artists to construct works right on the exhibition site; and in the work of sculptors such as Robert Morris, who ship plans instead of objects to museums, where the work can be created in the very space it will occupy.

Similar tendencies can be found in Ted Kraynik's plans for a "synergic" object, to be floated on hundreds of aluminum poles near a large city. Each pole changes in hue in response to activity in the city, activity centered in its utilities. Every time a phone call is made or a light switched off, the work will change. Like a human, Kraynik's work will constantly react to its surroundings. Hans Haacke and his followers brought the metaphor full circle by approaching his subject on an organic level. Haacke began by making plexiglass boxes filled with fluids that responded to gravity and to changing temperature and humidity. Later he exhibited ongoing natural processes, including, in one case, a brood of chickens hatching. Alan Sonfist built superbly programmed glass spheres provided with mineral crystals; touched by heat or light, the crystals turned into a purplish vapor and settled in intricate patterns on the surface of the glass. Sonfist also worked with



Alan Sonfist. *Crystal Enclosure*, 1969. Three-dimensional crystals enclosed in a glass sphere, changing from solid to gas in relation to atmospheric conditions. 18" diam., 23" l.



Hans Haacke. *Hydraulic Circulation System*, 1969. Fluid in plastic tubing. Approx. 12' x 24'. Courtesy Howard Wise Gallery, New York.

microorganisms that burst into iridescent colors upon contact with food. Newton Harrison extended both Haacke and Sonfist by exhibiting out-of-doors a salt-water "system" filled with brine, shrimp, and algae. Driven by the sun—the master engineer—the algae went through a continuing shift of blue-green and pink color changes.

In the foregoing examples, each representative of a wide variety of similar work, art came closer to the forms of contemporary life than to those of traditional painting and sculpture. Gabo used movement, but he anchored his vibrating rod in a static base. His work was fixed in a structure concerned

more with esthetic theory than with the life around it, as was most of the art that followed Gabo, no matter how radical its intent seemed to be. The environmental-systems movement expressed itself normally in media unfit for static, esoteric space. Moreover, its implicit goal—classification, organization, and response on a broad scale—pointed toward collaboration with the computer, as well as with engineering and industrial implementation on a highly sophisticated level. The progression here, similar to that in television, is away from the past, toward hybrid forms and concepts poised between art and technology.

Charles Frazier. *Drift Structure*, 1969. Plastic, glass, electronic hardware. 2' in diameter x 6' in length. This transparent structure is designed to drift in a large area of water. It transforms sunlight into power through a small transistorized radio receiver.



Hans Haacke. *Roller (and base)*, 1969. Liquid and plexiglass. 20" diam. Courtesy Howard Wise Gallery, New York.

